

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

1. REGISTRATION NO.
93-F-0008

CUSTOMER NO.
1202

FORM APPROVED
OMB NO. 0579-0036

ANNUAL REPORT OF RESEARCH FACILITY
(TYPE OR PRINT)

2. HEADQUARTERS RESEARCH FACILITY (Name and Address, as registered with USDA, include Zip Code)

NAVAL MEDICAL CTR SAN DIEGO
STE 5, DIV. OF ANIMAL RESOURCES
34800 BOB WILSON DRIVE
SAN DIEGO, CA 92134

(b)(6), (b)(7)(C)

3. REPORTING FACILITY (List all locations where animals were housed or used in actual research, testing, teaching, or experimentation, or need for these purposes. Attach additional sheets if necessary.)

FACILITY LOCATIONS/sites

See Attached Listing

(b)(2)High, (b)(7)(F)

(b)(2)High, (b)(7)(F)

REPORT OF ANIMALS USED BY OR UNDER CONTROL OF RESEARCH FACILITY (Attach additional sheets if necessary or use APHIS FORM 7023A)

A. Animals Covered By The Animal Welfare Regulations	B. Number of animals being bred, conditioned, or held for use in teaching, testing, experiments, research, or surgery but not yet used for such purposes.	C. Number of animals upon which teaching, research, experiments, or tests were conducted involving no pain, distress, or use of pain- relieving drugs.	D. Number of animals upon which experiments, teaching, research, surgery, or tests were conducted involving accompanying pain or distress to the animals and for which appropriate anesthetic, analgesic, or tranquilizing drugs were used.	E. Number of animals upon which teaching, experiments, research, surgery or tests were conducted involving accompanying pain or distress to the animals and for which the use of appropriate anesthetic, analgesic, or tranquilizing drugs would have adversely affected the procedures, results, or interpretation of the teaching, research, experiments, surgery, or tests. (An explanation of the procedures producing pain or distress in these animals and the reasons such drugs were not used must be attached to this report)	F. TOTAL NO. OF ANIMALS (Cols. C + D + E)
4. Dogs					
5. Cats	10		11		11
6. Guinea Pigs					
7. Hamsters					
8. Rabbits		34			34
9. Non-Human Primates					
10. Sheep			9		9
11. Pigs	5		79		79
12. Other Farm Animals					
13. Other Animals					
chinchillas	21			63	63

ASSURANCE STATEMENTS

- 1) Professionally acceptable standards governing the care, treatment, and use of animals, including appropriate use of anesthetic, analgesic, and tranquilizing drugs, prior to, during, and following actual research, teaching, testing, surgery, or experimentation were followed by this research facility.
- 2) Each principal investigator has considered alternatives to painful procedures.
- 3) This facility is adhering to the standards and regulations under the Act, and it has required that exceptions to the standards and regulations be specified and explained by the principal investigator and approved by the Institutional Animal Care and Use Committee (IACUC). A summary of all the exceptions is attached to this annual report. In addition to identifying the IACUC-approved exceptions, this summary includes a brief explanation of the exceptions, as well as the species and number of animals affected.
- 4) The attending veterinarian for this research facility has appropriate authority to ensure the provision of adequate veterinary care and to oversee the adequacy of other aspects of animal care and use.

CERTIFICATION BY HEADQUARTERS RESEARCH FACILITY OFFICIAL

(Chief Executive Officer or Legally Responsible Institutional official)

I certify that the above is true, correct, and complete (7 U.S.C. Section 2143)

SIGNATURE OF C.E.O. (b)(6), (b)(7)(C)	NAME & TITLE OF C.E.O. OR INSTITUTIONAL OFFICIAL (Type or Print)	DATE SIGNED
(b)(6), (b)(7)(C)	(b)(6), (b)(7)(C)	13 Nov 06

Column E Explanation

Registration Number: Certificate Number 93-F-008, Customer Number 1202

Number and Species of Animals: 63 Chinchillas

Explanation of Procedure Causing Possible Distress: Individual housing in an unfamiliar environment and exposure of chinchillas to 4kHz octave band noise at 105 dB sound pressure level for a duration of 6 hours. This procedure is considered non-painful but may induce distress. This exposure induces cochlear hair cell loss and a significant hearing threshold shift. This model is utilized to test various means to protect against cochlear hair cell loss and to potentially reverse cochlear hair cell loss.

Scientific Justification for Unrelieved Potential Distress: The potential distress of individual housing in an unfamiliar environment is being relieved through a habituation procedure for our experimental animals. This leaves the actual noise exposure as our only unrelieved potential for distress as defined by the AWA. Alleviation of this potential distress through the use of anesthetics or analgesics is scientifically contraindicated for the following reasons.

General Considerations

- a. Generalized anesthesia for a six-hour duration would be medically contraindicated and in itself leads to a painful and distressful recovery period.
- b. Animal models without anesthesia mimics human subjects under noise exposure better than the anesthetized animal.
- c. Noise exposure should try to replicate the real world as much as possible; we typically are not exposed to noise in an anesthetized state. The administration of drugs to sound exposed animal's effects several important aspects of sound transduction in the inner ear and electrophysiological measurements of inner ear function. Because these confounded results from drugged animals cannot be extended to human models, these drugged models are not used in hearing research. In the course of the Medline literature review going back over 20 years some 5500 abstracts involving loud sound exposure, only about a dozen utilized anesthetized animals and in those cases the focus of the studies was to investigate the effects of those drugs on cochlear electrophysiological measurements.
- d. Noise exposures in normal animals always result in significant variations in threshold shifts. These variations may result from a variety of factors such as, overactive middle ear muscles, efferent feedback, and state of the animal. Now there may be evidence that a drugged animal gives larger and more consistent threshold shifts because of the elimination of the aforementioned variables.¹

Specific Considerations

- a. Sodium pento-barbital has been shown to have a significant effect on total middle ear impedance and on the shape of the tympanograms.²

Column E Explanation cont.

- b. The use of ketamine causes significant increases in distortion-product otoacoustic emissions. This result indicates that tonic activity levels in the cochlear efferents are reduced by the anesthetic effects, which could lead to greater damage due to loud sound exposure.^{3,4}
- c. Isoflurane significantly attenuates auditory steady state response (which is a response of the brain to auditory stimuli) in a dose dependant manner.⁵

References:

- 1) Popelar, J., et al. Effect of noise on auditory evoked responses in awake guinea pigs. *Hearing Research*. 26(3):239-47, 1987
- 2) Eames, B.L., et al. The role of the middle ear in acoustic trauma from impulses. *Laryngoscope*. 85(9):1582-92, 1975
- 3) Harel, N., et al. The effects of anesthesia on otoacoustic emissions. *Hearing Research*. 110(12):25-33
- 4) Puel, Jean-Luc, et al. Perspectives in inner ear pharmacology and clinical applications. In *Cochlear pharmacology and noise trauma*. Eds. D. Prasher and B. Canlon. NRN Publications. London; 1998
- 5) Plourde, G., et al. the effect of isoflurane on the steady state response and on consciousness in human volunteers. *Anesthesiology*. 89(4):844-51, 1998